

Instructions for Completing Visual Assessment Data Sheets

One of the main purposes in setting up a volunteer monitoring program is to get more eyes out into the watershed to see what is going on, in other words, to collect data. Volunteer Monitoring promotes a strong sense of stewardship. It is also helpful in gathering data on waterbodies that are currently not assessed by the Department or waterbodies where more water quality information is needed by data users. Whether that data is used by the volunteers at the local level to provide information to their municipality, at the watershed level to identify or follow-up on problem areas in need of attention, at the State level to identify impaired waterways or in a study to provide baseline information, it needs to be consistent and structured so that the people using it can easily understand it and compare data from different sites.

The data sheets for this Visual Assessment tool were developed after reviewing data collection sheets from several NJ volunteer monitoring groups, the Department's original "Water Watch" RATS (River Assessment Teams) volunteer monitoring programs, the Natural Resource Conservation Service's Stream Visual Assessment Protocol and the EPA's Rapid Bio-Assessment Protocol and Volunteer Monitoring Manual. This protocol is New Jersey specific.

There are four data sheets, the General Sheet, Monitoring Sheet, the Assessment Sheet and the Pipe/Drainage Ditch Inventory Sheet. In addition to these sheets, it is recommended that some form of a reference map, either a hand drawn map, USGS topographic map or aerial photograph is used to mark the approximate locations of the reach and each notable feature.

The General Sheet is meant to determine where you are performing your assessment and the weather conditions surrounding your monitoring event. In the past, it has been difficult to determine where monitors have accessed their site, and where the monitors have walked. To insure the quality of your data, this sheet should be filled out completely. This sheet should be filled out in the field.

The Assessment Sheet is meant to obtain general information about the entire reach you are monitoring and general information about the surrounding watershed. There are two sections to the sheet, **Assessment within 50 feet of the bank** and **Assessment within ¼ mile of the stream**. The Assessment within 50 feet of the bank can be filled out at your site. The Assessment within ¼ mile of your stream will need to be filled out as your drive, bike, or walk around you stream.

This will be submitted per monitoring event and is intended to be filled out prior to and after the assessment is performed. The Assessment Sheet will stay relatively the same from monitoring event to event. The data you will be collecting on this sheet is extremely useful to water quality data users within the NJDEP because it allows data users to assess streamside land use in a more frequent manner.

The Monitoring Sheet is meant to obtain specific information. All the information asked for on this sheet will allow for a more thorough investigation and description of the health of your stream. This sheet is to be completed after your whole stretch has been walked and when you are still present at your site.

The Pipe/Drainage Ditch Inventory Sheet should be completed for every pipe and drainage ditch you find along your stretch. The pipe/ditch should also be marked on your reference map. There are many more pipes/ditches draining into our streams than we know. The data collected here is critical in determining point sources and nonpoint sources of pollution entering into the stream.

The following is a line-by-line explanation of how to fill out your data sheets, the techniques used for collecting the data, and the ways to obtain necessary information for your data sheets. This instruction booklet also contains a reference source section, definition section, a line by line instruction guide, a quick reference field sheet, a canopy cover chart, a municipal code chart, a Statewide watershed map, acronym list, and a copy of the NJDEP ecoregion reference monitoring station map.

General Reach Sheet

Segment ID #:

This ID will be assigned to you by the Department and will be used to identify the stream segment. It may also be referred to as the stream id#. The number allows the Department to locate what water quality segment you are assessing.

Assessment # of the year:

This number is to distinguish different sampling events that have occurred on the same stream segment. In training, we have discussed that you should stream walk 4 to 6 times per year at the same time of year; once a season, after a high flow event and low flow event. For example, the first assessment # will be 1 of 6, the second, 2 of 6 and so on.

Stream Name:

The name of the stream can be determined from the USGS quadrangle maps, street maps or if there is a local name for the stream. If no name is available the stream should be identified as an unnamed tributary to the nearest stream that the name is known.

Watershed Management Area:

This refers to one of the 20 Watershed Management Areas identified by the Department. See attached map, or this information can be obtained from the Department.

Municipal Code(s):

Enter the appropriate code from Municipality Code Table that corresponds to the Municipality or Municipalities within which the assessment was performed.

Segment Identification:

Beginning Mile Marker: This is determined by reviewing USGS maps or GIS digital maps.

You need to identify where the stream starts (the headwaters) and measure the mileage from headwaters down to where you are starting your assessment.

Ending Mile Marker: This is the mile marker that you stopped your stream walk.

If you have trouble identifying your beginning and ending mile marker, the Volunteer Monitoring Coordinator will be able to assist you.

GPS Coordinates:

Should be taken at the beginning point and ending point of your assessment.

Latitude and Longitude: If you have access to a GPS unit, please provide the coordinates of your starting point. This will allow for the Department to easily identify your stream segment. If you do not have access to a GPS unit, you can identify latitude and longitude on a USGS topographic map. You can also contact the Volunteer Coordinator for help.

Survey Team:

Names of the people involved in this survey.

Time:

Time of day when the assessment was performed.

Date:

Date on which the assessment was performed.

Weather:

Fill in the appropriate number:

(1. Clear, 2. Overcast, 3. Light rain/Showers, 4. Steady Rain, 5. Heavy Rain, 6. Snow, 7. Heavy Snow Melt) that best describes the weather conditions on the day of the assessment, within the last 48 hours before the assessment and during the week preceding the assessment.

Days Since Last Rain:

The number of days since the last rainfall prior to the day of the assessment.

Current Air Temperature:

Enter the air temperature in F at the time of the assessment.

Site Sketch:

This should be a hand drawn map of your stream segment. This should not be a substitute of your USGS topography map or GIS digital map. Your hand drawn map will allow you more room to add notes and mark such features as pools, riffles, runs, road crossings, transect locations, outfalls, ditches, stream confluences, flocks of waterfowl, etc. Please be sure to include anything you may see along your stream walk.

Monitoring Sheet

There are two predominate types of streams, high gradient and low gradient streams, and NJ has both. High gradient streams are found in areas that have some elevation above sea level like the Highlands or the Piedmont region. Low gradient streams are found in low-lying areas like the Coastal Plains or the Pinelands. Your monitoring sheet results will depend upon if you are in a low or high gradient stream. Which type of stream you are monitoring will influence descriptions 1-10. For example, embeddedness may not be a determination you can make if you are in a low gradient stream,

however, sediment in the stream will be something that you can assess in a low gradient stream and it will give data users the same information as embeddedness.

Stream Width and Depth

Stream Width:

There are two ways to complete this description, one for wadable streams and one for streams you can not safely walk cross or non-wadable.

For Non-Wadable Streams:

Fill in the number that best identifies the overall reach.

1. Constant means that the width remains fairly uniform throughout the entire reach.
2. Widening means that the stream gradually but noticeably widens from upstream to downstream.
3. Mild constrictions mean that at one or more locations in the reach narrows slightly then widens out again.
4. Sharp constriction means that at one or more locations in the reach the stream narrows to at least half the normal width of the stream and then widens out again.

For Wadable Streams:

Using the tape measure in feet or meters, take several measures of stream width at different points in the reach being surveyed. The width should be taken at same location as the stream depth (see below).

Record each width as **W₁**, **W₂**, etc.

Then divide the sum of the widths by the number measurements taken +1

(Sum of the widths/Number of measures +1). This is the Stream Width average.

Stream Depth:

For Non-Wadable Streams:

Fill in the number that best identifies the overall reach.

1. Constant means that the depth for the entire reach remains constant.
2. Variable (pools and riffles) means that the depth varies because the stream is made up of a series of pools and riffles.
3. Variable (constrictions) means that the depth varies in the reach because constrictions in the stream channel cause ponding.

For Wadable Streams:

Stream velocity and stream depth can greatly affect the aquatic life of a stream. The best stream habitat includes all of the following combinations of velocity and depth:

Slow (<1ft/sec), shallow (<1.5ft)

Slow, deep

Fast, deep

Fast, shallow

EPA, Volunteer Stream Monitoring Manual. 1995

First, measure stream velocity by marking off a 10 foot section of stream run, on a straight section of stream bank and measuring the time (with a stop watch) it takes a stick, orange, or any other biodegradable object to float the 10 feet. Repeat 5 times using the same floating tool, in the same 10-foot section, and determine the average time. Divide the average time by 10 to determine velocity in feet per second.

Second, measure the stream depth by using a meter stick and taking readings. Take measurements at various points within the your stream segment, riffles, pools, and runs. Your sample points need to be collected within the same 10-foot section as the velocity. Mark how many combinations are in your stretch.

Stream Sinuosity:

Sinuosity refers to the natural tendency for a stream to meander. Characterizes the stream sinuosity by filling in the number that best identifies the overall reach.

1. Straight-natural means that the channel is fairly straight with no visible evidence of artificial bank stabilization.
2. Straight-channelized means that the channel is straight and has obviously been channelized with an artificial lining or bank stabilization.
3. Slight Bends
4. Moderate Bends
5. Sharp bends (oxbows)

Stream Flow:

This is referring to the flow appearance of the surface water of the stream. Fill in the number that best identifies the reach.

1. Slow means that when looking at the stream the water does not appear to be moving or is barely moving.
2. Moderate means that when looking at the stream, the water appears to be moving but the surface still appears flat.
3. Swift means that the water is moving fast and the surface of the water is not flat.
4. Combination means that the flow in the reach varies because the reach is made up of pools and riffles and/or constrictions that are causing ponding of the water.

Pools and Riffles:

Pools and riffles refer to the mixture of flows and depths that create in-stream habitat for invertebrates and fish. Pools are deeper than the average stream depth with slower moving water than the average flow appearance. Riffles are shallower depth areas of the stream segment with faster, turbulent water running over gravel and/or rocks. This description will be dependent upon the stream gradient. Pools and riffles are typical of healthy high gradient streams, you may not find noticeable defined pools or riffles in a low gradient stream.

1. None present

2. Present

Stream Substrate:

This refers to the material on the stream bottom. You may have more than one but pick the dominant one for your stream segment and be sure to note the other types of substrate present.

Choose the number that best describes the predominant bottom in the reach. If the bottom is composed of some material not listed, note the material in the "other" space.

1. Fine particles--silt/clay/mud. This substrate has a sticky, cohesive feeling. The particles are fine. The spaces between the particles hold a lot of water, making the sediments behave like ooze.
2. Sand— less than 0.25 cm particle size. A sandy bottom is made of tiny, gritty particles of rock that are smaller than gravel but coarser than silt.
3. Gravel—.25 cm to 5 cm particle size. A gravel bottom is made up of stones.
4. Cobble—5 cm to 25 cm
5. Boulder—25 cm or larger. These are the rocks that are too large to move by yourself.
6. Bedrock—Solid unbroken rock

Stream Substrate Stability:

This will help determine if the bottom of the stream is established or if new material is entering into the stream. While you are standing in the stream kick your feet around.

1. If you kick up a plume of fine particles and can move around the rocks easily the bottom is loose.
2. If your action does not kick up a large plume and you can feel the rocks are anchored, the bottom is stable.

Embeddedness(for High Gradient Streams):

Embeddedness is the extent to which rocks (gravel, cobbles, boulders) are sunken into the silt, sand, or mud of a stream bottom. Embeddedness is easier to identify in high gradient streams than in low gradient streams. To estimate the embeddedness, observe the amount of fine particles overlying, in between, and surrounding the rocks. Generally, the more that rocks are embedded the less rock surface or space between rocks is available as habitat for invertebrates and spawning fish.

To determine embeddedness pick up a rock within the stream. As you look at the side of the rock you will be able to see a line or discoloration that indicates where the sediment line was. There will be a difference in the color of the rock that was embedded and the color of the rock that was exposed.

1. 0-25% surrounded by fine sediment
2. 26-50% surrounded by fine sediment
3. 51-75% surrounded by fine sediment
4. 76% or greater surrounded by fine sediment

Sediment in the Stream (for Low Gradient Stream):

This description can be used for describing low gradient streams with little or no rocks to be able to check for embeddedness. Choose the number that best describes the reach.

1. None means that the natural streambed is visible.
2. Light means that there is some deposition of material in the slower moving portions of the channel.
3. Moderate means that the channel bed from bank to bank is covered by deposited material.
4. Severe means that sand bars have formed as islands.

Bank Stability Left and Right Bank:

Bank Stability refers to the existence of or the potential for detachment of soils from the stream banks and its movement into a stream. Excessive bank erosion occurs when the watershed surrounding the stream has been altered. An example of this may be a newly constructed parking lot on the stream bank. Precipitation will hit the parking area and rush off site quickly and towards the stream and cause the stream flow to rapidly increase which may cause the banks to erode. Left and right bank is determined by looking up stream. Signs of erosion may include exposed tree roots, undercut banks, unvegetated banks, evidence of vehicles, grazing areas, and walking paths.

Pick the number that best describes what you see.

1. Stable-Evidence of erosion or bank failure absent or minimal; <5% of bank affected.
2. Moderately Stable-Small areas of erosion, mostly healed over; 5-30% of bank in reach has areas of erosion.
3. Moderately Unstable- 31-60% of bank in reach has areas of erosion, high erosion potential during flooding.
4. Unstable- many eroded areas, "raw" areas frequent; obvious bank sloughing; 60% or > of bank erosion scars.

% of stream covered by tree canopy:

Shading of a stream is important for cold water fish species like trout because it keeps the temperature of the stream down. The time of year and time of day you are performing your assessment can affect your result. You may need to visit the site in mid-summer to determine the full canopy cover. Try to visualize the tall overhanging treetops as they will look when they have their leaves on in the summer. If you are in a predominate evergreen forest you should be able to determine this anytime of year. Look at the visual method chart for estimating tree canopy cover to determine which description. Stand at the streams edge and straight up toward the sky. Use your best judgment in picking the number that best represents the estimated percentage of stream coverage.

1. 0-25%
2. 26-50%
3. 51-75%
4. 76% or greater

Riparian Vegetation:

Riparian vegetation refers to the vegetation contiguous with the stream bank. It can be any type of natural vegetation and must consist of a good mix of vegetation including aquatic plants, sedges, rushes, grasses, forbs, shrubs, understory trees, and large trees. A healthy riparian zone is critical to a healthy stream. Again, left and right bank is determined by looking up stream. Pick the number that best describes what is observed on both banks.

1. >50 ft width
2. 35 - 50 ft width
3. 15 - 35 ft width
4. < 15 ft width

Woody Debris:

Woody debris means fallen trees or tree limbs in the stream. Woody debris can create in-stream habitat for invertebrates and fish. Too much woody debris can negatively impact a stream by slowing down stream flow or by causing a barrier to fish movement. Pick the number that best describes what was observed.

1. None

2. In spots
3. Heavy throughout reach

Woody Debris:

This description will give more detail about the woody debris. If the debris is free floating, it may have recently floated down stream. If the debris is establish and attached it will provide habitat.

1. Free floating
2. Attached

Predominant Aquatic Vegetation:

Aquatic Vegetation is normal in streams. It provides food and habitat for aquatic life. However, excessive aquatic vegetation will affect the health of a stream. Plant respiration and decomposition uses dissolved oxygen in the water. If there are too many plants in the stream, the aquatic life in the stream may suffocate because of the lack of dissolved oxygen.

Pick the number that best describes the predominant aquatic vegetation observed.

1. Rooted Submergent means the vegetation is completely underwater.
2. Rooted Emergent means vegetation is rooted in substrate and is partially exposed above the water surface.
3. Rooted Floating means vegetation is rooted into the substrate and is floating on top of the water surface, an example is a lily pad.
4. Free Floating means vegetation is not rooted or attached to anything, an example is dick weed.

Algae Location:

The amount of algae in the stream will also affect the amount of available dissolved oxygen for aquatic life.

Pick the number that best describes where algae are located.

1. None
2. On streambed
3. On surface
4. Both

Algae Color:

Pick the number that best describes the color of the predominate algae seen.

1. Light Green
2. Dark Green
3. Brown
4. Other, note other color

Channel Alteration:

Signs of channelization or straightening of the stream may include an unnaturally straight section of a stream, high banks, or lack of flow diversity (pools, riffles, runs), uniform-sized stream substrate, vegetation may be missing or lacking diversity or missing woody vegetation.

1. Stream with normal pattern
2. Some channelization present, usually in areas of bridges etc...
3. Channelization extensive, 40-80% of the stream reach
4. Over 80% of the stream channelized, gabion baskets and/or riprap, and/or concert present.

Structures:

Bridges, culverts, weirs, and dams are all examples of in-stream human made structures that will affect the stream's health. Please mark the structures observed in the stream within the reach. Identify any other structures observed above and below your stretch.

Water Condition:

This section is describing some basic fundamentals of water conditions without using a water quality test kit.

Odor: The odor of the stream will be dependant upon the time of year you are assessing. You may notice an anaerobic smell in the summer when the stream flow is slow and the temperature is warm. This may indicate the dissolved oxygen in the stream is low.

Fill in the number that best describes the general water odor along the reach of the stream.

1. Normal
2. Sewage
3. Petroleum
4. Chemical
5. Anaerobic
6. Other

Color:

The natural color of the stream will be dependant upon what region you are assessing. For example, Pine Barren waterbodies are tea colored. This is caused by the ecosystem's chemistry.

Fill in the number that best describes the general watercolor along the reach of the stream:

1. Clear
2. Tea
3. Milky
4. Muddy
5. Other

Surface Coating: Fill in the number that best describes the general surface coating along the reach of the stream.

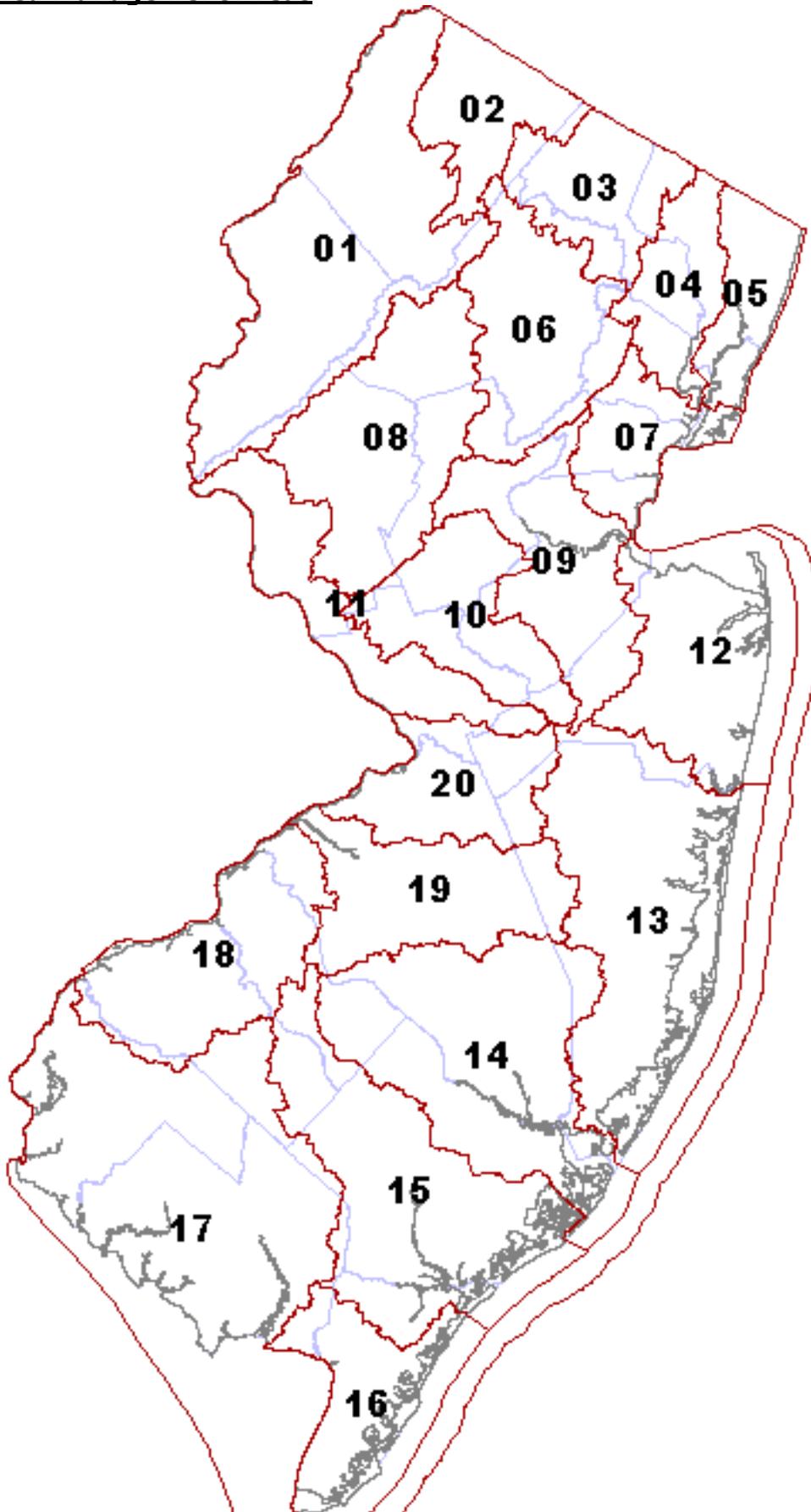
1. None
2. Oily-This can be natural or petroleum based. To tell the two types apart move the surface water around with a stick, if the oily coating is natural it will break up (like a puzzle) and stay part. If the oily coating is petroleum based, it will break up but then quickly move back together (like salad oil in oil and vinegar after you shake it up it will always separate out again.)
3. Foam-This can also be naturally occurring. One way that may help to tell the natural foam and the petroleum-based foam (usually soap or detergent) apart is by looking closely at the bubbles within the foam. If the bubbles have a noticeable iridescent shine to them, more than like it is not naturally occurring foam.
4. Scum
5. Other-please explain other

Other Observations: Fill in any other observations made about the reach. This can include wildlife observed, anything that appears out of the ordinary or information obtained by talking with local residents concerning the history of land use in the area. Observation locations should be marked on the map of the area that you prepare.

GPS reference location #'s: Assign a number to each GPS point or line and mark the location of the point on the working map.

Photo Reference #'s: Assign each photo taken a number, and mark the location and direction of the photo on the working map.

Watershed Management Areas



Municipality Codes

Municipality	Code	Municipality	Code	Municipality	Code	Municipality	Code
ATLANTIC COUNTY							
Absecon City	0101	Ridgewood Village	0251	Gibbsboro Borough	0413	Nutley Township	0716
Atlantic City	0102	River Edge Borough	0252	Gloucester City	0414	Orange City Township	0717
Brigantine City	0103	Rivervale Township	0253	Gloucester Township	0415	Roseland Borough	0718
Buena Borough	0104	Rochelle Park Township	0254	Iladdon Township	0416	South Orange Village Twp.	0719
Buena Vista Township	0105	Rockleigh Borough	0255	Haddonfield Borough	0417	Verona Township	0720
Corbin City	0106	Rutherford Borough	0256	Haddon Heights Borough	0418	West Caldwell Township	0721
Egg Harbor City	0107	Saddle Brook Township	0257	Hi Nella Borough	0419	West Orange Township	0722
Egg Harbor Township	0108	Saddle River Borough	0258	Laurel Springs Borough	0420		
Estell Manor City	0109	South Hackensack Twp.	0259	Lawnside Borough	0421	GLOUCESTER COUNTY	
Folsom Borough	0110	Teaneck Township	0260	Lindenwold Borough	0422	Clayton Borough	0801
Galloway Township	0111	Tenafly Borough	0261	Magnolia Borough	0423	Deptford Township	0802
Hamilton Township	0112	Teterboro Borough	0262	Merchantville Borough	0424	East Greenwich Township	0803
Hammonton Town	0113	Upper Saddle River Bor.	0263	Mount Ephraim Borough	0425	Elk Township	0804
Linwood City	0114	Waldwick Borough	0264	Oaklyn Borough	0426	Franklin Township	0805
Longport Borough	0115	Wallington Borough	0265	Pennsauken Township	0427	Glassboro Borough	0806
Margate City	0116	Washington Township	0266	Pine Hill Borough	0428	Greenwich Township	0807
Mullica Township	0117	Westwood Borough	0267	Pine Valley Borough	0429	Harrison Township	0808
Northfield City	0118	Woodcliff Lake Borough	0268	Runnemede Borough	0430	Logan Township	0809
Pleasantville City	0119	Wood Ridge Borough	0269	Somerdale Borough	0431	Mantua Township	0810
Port Republic City	0120	Wyckoff Township	0270	Stratford Borough	0432	Monroe Township	0811
Somers Point City	0121			Tavistock Borough	0433	National Park Borough	0812
Ventnor City	0122	BURLINGTON COUNTY		Voorhees Township	0434	Newfield Borough	0813
Weymouth Township	0123	Bass River Township	0301	Waterford Township	0435	Paulsboro Borough	0814
		Beverly City	0302	Winslow Township	0436	Pitman Borough	0815
		Bordentown City	0303	Woodlyne Borough	0437	South Harrison Township	0816
		Bordentown Township	0304			Swedesboro Borough	0817
BERGEN COUNTY		Burlington City	0305	CAPE MAY COUNTY			
Allendale Borough	0201	Burlington Township	0306	Avalon Borough	0501	Washington Township	0818
Alpine Borough	0202	Chesterfield Township	0307	Cape May City	0502	Wenonah Borough	0819
Bergenfield Borough	0203	Cinnaminson Township	0308	Cape May Point Borough	0503	West Deptford Township	0820
Bogota Borough	0204	Delanco Township	0309	Dennis Township	0504	Westville Borough	0821
Carlstadt Borough	0205	Delran Township	0310	Lower Township	0505	Woodbury City	0822
Cliffside Park Borough	0206	Eastampton Township	0311	Middle Township	0506	Woodbury Heights nor.	0823
Closter Borough	0207	Edgewater Park Township	0312	North Wildwood City	0507	Woolwich Township	0824
Cresskill Borough	0208	Evesham Township	0313	Ocean City	0508		
Demarest Borough	0209	Fieldsboro Borough	0314	Sea Isle City	0509	HUDSON COUNTY	
Dumont Borough	0210	Florence Township	0315	Stone Harbor Borough	0510	Bayonne City	0901
East Rutherford Borough	0212	Hainesport Township	0316	Upper Township	0511	East Newark Borough	0902
Edgewater Borough	0213	Lumberton Township	0317	West Cape May Borough	0512	Guttenberg Town	0903
Elmwood Park Borough	0211	Mansfield Township	0318	West Wildwood Borough	0513	Harrison Town	0904
Emerson Borough	0214	Maple Shade Township	0319	Wildwood City	0514	Hoboken City	0905
Englewood City	0215	Medford Township	0320	Wildwood Crest Borough	0515	Jersey City	0906
Englewood Cliffs Boro	0216	Medford Lakes Borough	0321	Woodbine Borough	0516	Kearny Town	0907
Fair Lawn Borough	0217	Moorestown Township	0322			North Bergen Township	0908
Fairview Borough	0218	Mount Holly Township	0323	CUMBERLAND COUNTY			
Fort Lee Borough	0219	Mount Laurel Township	0324	Bndgeton City	0601	Secaucus Town	0909
Franklin Lakes Borough	0220	New Hanover Township	0325	Commercial Township	0602	Union City	0910
Garfield City	0221	North Hanover Township	0326	Deerfield Township	0603	Weehawken Township	0911
Glen Rock Borough	0222	Palmyra Borough	0327	Downe Township	0604	West New York Town	0912
Hackensack City	0223	Pemberton Borough	0328	Fairfield Township	0605		
Harrington Park Borough	0224	Pemberton Township	0329	Greenwich iownship	0606	HUNTERDON COUNTY	
Hasbrouck Heights Bor.	0225	Riverside Township	0330	Hopewell Township	0607	Alexandria Township	1001
Haworth Borough	0226	Riverton Borough	0331	Lawrence Township	0608	Bethlehem Township	1002
Hillsdale Borough	0227	Shamong Township	0332	Maurice River Township	0609	Bloomsbury Borough	1003
Hohokus Borough	0228	Southampton Township	0333	Millville City	0610	Califon Borough	1004
Leonia Borough	0229	Springfield Township	0334	Shiloh Borough	0611	Clinton Town	1005
Little Ferry Borough	0230	Tabernacle Township	0335	Stow Creck Township	0612	Clinton Township	1006
Lodi Borough	0231	Washington Township	0336	Upper Deerfield Twp.	0613	Delaware Township	1007
Lyndhurst Township	0232	Westampton Township	0337	Vineland City	0614	East Amwell Township	1008
Mahwah Township	0233	Willingboro Township	0338			Flemington Borough	1009
Maywood Borough	0234	Woodland Township	0339	ESSEX COUNTY			
Midland Park Borough	0235	Wnghtstown Borough	0340	Belleville Township	0701	Franklin Township	1010
Montvale Borough	0236			Bloomfield Township	0702	Frenchtown Borough	1011
Moonachie Borough	0237	CAMDEN COUNTY		Caldwell Borough Twp.	0703	Glen Gardner Borough	1012
New Milford Borough	0238	Audubon Borough	0401	Cedar Grove Township	0704	Hampton Borough	1013
North Arlington Borough	0239	Audubon Park Borough	0402	East Orange City	0705	High Bridge Borough	1014
Northvale Borough	0240	Barrington Borough	0403	Essex Fells Twp.	0706	Holland Township	1015
Norwood Borough	0241	Bellmawr Borough	0404	Fairfield Township	0707	Kingwood Township	1016
Oakland Borough	0242	Berlin Borough	0405	Glen Ridge Twp.	0708	Lambertville City	1017
Old Tappan Borough	0243	Berlin Township	0406	Irvington Township	0709	Lebanon Borough	1018
Oradell Borough	0244	Brooklawn Borough	0407	Livingston Township	0710	Lebanon Township	1019
Palisades Park Borough	0245	Camden City	0408	Maplewood Township	0711	Milford Borough	1020
Paramus Borough	0246	Cherry Hill Township	0409	Montclair Township	0712	Raritan Township	1021
Park Ridge Borough	0247	Chesilhurst Borough	0410			Readington Township	1022
Ramsey Borough	0248					Stockton Borough	1023
						Tewksbury Township	1024
						Union Township	1025

County/Municipality Codes

Municipality	Code	Municipality	Code	Municipality	Code	Municipality	Code		
MERCER COUNTY									
East Windsor Township	1101	Monmouth Beach Borough	1334	Lakehurst Borough	1514	Warren Township	1820		
Ewing Township	1102	Neptune City Borough	1336	Lakewood Township	1515	Watchung Borough	1821		
Hamilton Township	1103	Neptune Township	1335	Lavallette Borough	1516	SUSSEX COUNTY			
Hightstown Borough	1104	Ocean Township	1337	Little Egg Harbor Twp.	1517	Andover Borough	1901		
Hopewell Borough	1105	Oceanport Borough	1338	Long Beach Township	1518	Andover Township	1902		
Hopewell Township	1106	Red Bank Borough	1339	Manchester Township	1519	Branchville Borough	1903		
Lawrence Township	1107	Roosevelt Borough	1340	Mantoloking Borough	1520	Byram Township	1904		
Pennington Borough	1108	Rumson Borough	1341	Ocean Gate Borough	1522	Frankford Township	1905		
Princeton Borough	1109	Sea Bright Borough	1342	Ocean Township	1521	Franklin Borough	1906		
Princeton Township	1110	Sea Girt Borough	1343	Pine Beach Borough	1523	Fredon Township	1907		
Trenton City	1111	Shrewsbury Borough	1344	Plumsted Township	1524	Green Township	1908		
Washington Township	1112	Shrewsbury Township	1345	Point Pleasant Borough	1525	Hamburg Borough	1909		
West Windsor Township	1113	South Belmar Borough	1346	Pt. Pleasant Beach Bor.	1526	Hampton Township	1910		
MIDDLESEX COUNTY									
Carteret Borough	1201	Spring Lake Borough	1347	Seaside Heights Borough	1527	Hardyston Township	1911		
Cranbury Township	1202	Spring Lake Heights Bor.	1348	Seaside Park Borough	1528	Hopatcong Borough	1912		
Dunellen Borough	1203	Tinton Falls Borough	1349	Ship Bottom Borough	1529	Lafayette Township	1913		
East Brunswick Township	1204	Union Beach Borough	1350	South Toms River Bor.	1530	Montague Township	1914		
Edison Township	1205	Upper Freehold Township	1351	Stafford Township	1531	Newton Town	1915		
Helmetta Borough	1206	Wall Township	1352	Surf City Borough	1532	Ogdensburg Borough	1916		
Highland Park Borough	1207	West Long Branch Boro	1353	Tuckerton Borough	1533	Sandyston Township	1917		
Jamesburg Borough	1208	MORRIS COUNTY		PASSAIC COUNTY		Sparta Township	1918		
Metuchen Borough	1209	Boonton Town.	1401	Bloomington Borough	1601	Stanhope Borough	1919		
Middlesex Borough	1210	Boonton Township	1402	Clifton City	1602	Stillwater Township	1920		
Milltown Borough	1211	Butler Borough	1403	Haledon Borough	1603	Sussex Borough	1921		
Monroe Township	1212	Chatham Borough	1404	Hawthorne Borough	1604	Vernon Township	1922		
New Brunswick City	1213	Chatham Township	1405	Little Falls Township	1605	Walpack Township	1923		
North Brunswick Twp.	1214	Chester Borough	1406	North Haledon Borough	1606	Wantage Township	1924		
Old Bridge Township	1215	Chester Township	1407	Passaic City	1607	UNION COUNTY			
Perth Amboy City	1216	Denville Township	1408	Paterson City	1608	Berkeley Heights Twp.	2001		
Piscataway Township	1217	Dover Town	1409	Pompton Lakes Borough	1609	Clark Township	2002		
Plainsboro Township	1218	East Hanover Township	1410	Prospect Park Borough	1610	Cranford Township	2003		
Sayreville Borough	1219	Florham Park Borough	1411	Ringwood Borough	1611	'Elizabeth City	2004		
South Amboy City	1220	Hanover Township	1412	Totowa Borough	1612	Fanwood Borough	2005		
South Brunswick Twp.	1221	Harding Township	1413	Wanaque Borough	1613	Garwood Borough	2006		
South Plainfield Bor.	1222	Jefferson Township	1414	Wayne Township	1614	Hillside Township	2007		
South River Borough	1223	Kinnelon Borough	1415	West Milford Township	1615	Kenilworth Borough	2008		
Spotswood Borough	1224	Lincoln Park Borough	1416	West Paterson Borough	1616	Linden City	2009		
Woodbridge Township	1225	Long Hill Township	1430	SALEM COUNTY				Mountainside Borough	2010
MONMOUTH COUNTY									
Aberdeen Township	1301	Madison Borough	1417	Alloway Township	1701	New Providence Boro	2011		
Allenhurst Borough	1302	Mendham Borough	1418	Carneys Point Township	1702	Plainfield City	2012		
Allentown Borough	1303	Mendham Township	1419	Elmer Borough	1703	Rahway City	2013		
Asbury Park City	1304	Mine Hill Township	1420	Elsinboro Township	1704	Roselle Borough	2014		
Atlantic Highlands Bor.	1305	Montville Township	1421	Lower Alloways Crk. Twp.	1705	Roselle Park Borough	2015		
Avon By The Sea Bor.	1306	Morris Plains Borough	1423	Mannington Township	1706	Scotch Plains Township	2016		
Belmar Borough	1307	Moms Township	1422	Oldmans Township	1707	Springfield Township	2017		
Bradley Beach Borough	1308	Morristown Town	1424	Penns Grove Borough	1708	Summit City	2018		
Brielle Borough	1309	Mountain Lakes Borough	1425	Pennsville Township	1709	Union Township	2019		
Colts Neck Township	1310	Mt. Arlington Borough	1426	Pilesgrove Township	1710	Westfield Town	2020		
Deal Borough	1311	Mt. Olive Township	1427	Pittsgrove Township	1711	Winfield Township	2021		
Eatontown Borough	1312	Netcong Borough	1428	Quinton Township	1712	WARREN COUNTY			
Englishtown Borough	1313	Parsippany-Troy Hills Twp.	1429	Salem City	1713	Allamuchy Township	2101		
Fair Haven Borough	1314	Pequannock Township	1431	Upper Pittsgrove Twp.	1714	Alpha Borough	2102		
Farmingdale Borough	1315	Randolph Township	1432	Woodstown Borough	1715	Belvidere Town	2103		
Freehold Borough	1316	Riverdale Borough	1433	SOMERSET COUNTY				Blairtown Township	2104
Freehold Township	1317	Rockaway Borough	1434	Bedminster Township	1801	Franklin Township	2105		
Hazlet Township	1318	Rockaway Township	1435	Bernards Township	1802	Frelinghuysen Twp	2106		
Highlands Borough	1319	Roxbury Township	1436	Bernardsville Borough	1803	Greenwich Township	2107		
Holmdel Township	1320	Victory Gardens Borough	1437	Bound Brook Borough	1804	Hackettstown Town	2108		
Howell Township	1321	Washington Township	1438	Branchburg Township	1805	Hardwick Township	2109		
Interlaken Borough	1322	Wharton Borough	1439	Bridgewater Township	1806	Harmony Township	2110		
Keansburg Borough	1323	OCEAN COUNTY		Far Hills Borough	1807	Hope Township	2111		
Keyport Borough	1324	Barneget Township	1501	Franklin Township	1808	Independence Township	2112		
Little Silver Borough	1325	Barneget Light Borough	1502	Green Brook Township	1809	Knowlton Township	2113		
Loch Arbour Village	1326	Bay Head Borough	1503	Hillsborough Township	1810	Liberty Township	2114		
Long Branch City	1327	Beach Haven Borough	1504	Manville Borough	1811	Lopatcong Township	2115		
Manalapan Township	1328	Beachwood Borough	1505	Millstone Borough	1812	Mansfield Township	2116		
		Berkeley Township	1506	Montgomery Township	1813	Oxford Township	2117		
		Brick Township	1507	North Plainfield Borough	1814	Phillipsburg Town	2119		
		Dover Township	1508						

Manasquan Borough	1329	Eagleswood Township	1509	Peapack-Gladstone Bor.	1815	Pohatcong Township	2120
Marlboro Township	1330	Harvey Cedars Borough	1510	Raritan Borough	1816	Washington Borough	2121
Matawan Borough	1331	Island Heights Borough	1511	Rocky Hill Borough	1817	Washington Township	2122

Pipe & Drainage Ditch Inventory Sheet

Outfall Pipe Reference #: Assign a reference number for each outfall that is observed and record it on the working map.

Pipe Diameter: Enter the estimated diameter of the pipe.

Type: Pick the number that best describes the type of discharge from the pipe. Storm drain means that the discharge is from storm sewers from an adjacent development or highway/road system. Residential discharge means a pipe from a nearby home discharging water from a sump, drain or washer. Industrial Discharge (NJPDES#) means a permitted industrial discharge. These discharges will be clearly marked in the field and should be identified prior to going out. The NJPDES permit number should be recorded here. Other means any other discharge that you observe whether or not you can identify the specific type.

Pipe Material: Pick the number that best describes the pipe material.

Pipe Location: Pick the number that best describes the location of the pipe in relation to the stream bank. In stream means that the end of the discharge pipe is located at the bottom of the stream bank or in the channel. Top of bank means that the end of the discharge pipe is located at or slightly behind the top of bank and discharges down the bank. Behind bank means that the end of the discharge pipe is located a distance away from the stream and the discharge is conveyed either in a channel or allowed to flow overland to the stream.

Pipe Flow: Pick the number that best describes the flow coming out of the pipe.

Flow Appearance: Pick the number that best describes the appearance of the flow leaving the pipe.

Is the Stream bank at the outfall eroded? Enter yes or no. Yes means that the area around the discharge pipe is eroding.

Stream Channel Downstream: Pick the number that best describes the condition of the stream channel downstream of the outfall.

Drainage Ditch #: Assign a reference number for any drainage ditch found and record it on the working map.

Begins at: If possible, find the origin of the ditch and pick the number that best defines it.

Ditch Lining: Pick the number that best defines the lining of the ditch.

Ditch is: enter the appropriate number.

Ditch Flow: Pick the number that best describes the flow in the ditch.

Flow Appearance: Pick the number that best describes the appearance of the flow in the ditch.

Other Observations: Enter any other observations that are made to further explain the information that was entered on this sheet or were not listed on this sheet.

Photo Reference #'s: Assign each photo taken a number and mark the location and direction of the photo on the working map.

GPS reference location #'s: Assign a number to each GPS point or line and mark the location of the point on the working map.

